

Reconsideration and withdrawal of the rejection of claims 1 to 7, now replaced with claims 8 through 19, under 35 U.S.C. 103(a) as being unpatentable over GB 1,481,022 in view of US 5,775,152 and the article 'Novel Seal Designs Thwart Leaks' is respectfully requested.

The object of the present invention is to configure a simple method and a device for **contactless sealing of a gap** between a partition and a strip at the delivery area of cold-rolling and strip rolling devices such that, with an acceptable energy expenditure and a minimal noise development, a dry strip surface as well as a complete separation of the damp-wet roll area from the finish-rolled strip are achieved.

According to the inventive method, a partition is arranged in the delivery area for separating a damp area (35) of the rolling mill from a dry area (34) that is a further delivery area downstream of a last roll stand, wherein an upper part of the partition above the strip (10) extends up to a stand platform and a lower part of the partition below the strip (10) extends down to base plate; the strip (10) is subjected to a gas under pressure at a right angle to the strip surface from above and from below via blast nozzles (23) provided on the ends of the partition (12, 13) facing the strip and on the components (14, 15, 16, 16', 17, 17') of the partition and, across the entire

strip width a gap (30) between the ends of the partition (12, 13; 14, 15) facing the strip and the upper and lower strip surfaces is sealed by a cushion of a compressed gas buffer generated by the gas under pressure, wherein the gap has a width of 0.1 to 1 mm; and the compressed gas (33) is guided away above and below the strip (10) parallel to the strip surface in the form of a split flow (32) in the direction toward the rolling mill or the damp area (35) and of a split flow (31) in the opposite direction toward the dry area (34).

In regard to the device, the object is achieved by providing a stationary partition (12, 13) stationarily arranged above and below the strip (10) and having an upper part (12) above the strip (10) extending up to the stand platform and having a lower part (13) below the strip (10) extending down to the base plate; a movable partition (16, 16', 17, 17') comprising frames (14, 15) configured to extend the stationary partition (12, 13) to a location closely above and below a strip surface of the strip; blast nozzle bars (18, 19) arranged at ends (16', 17') of the movable partition facing the strip and extending across the entire strip width; wherein the blast nozzle bars (18, 19) have blast nozzles (23) oriented perpendicularly relative to the strip surface and blast nozzle surfaces facing the strip and extending parallel to the strip surface for creating a seal, across the entire strip width, in a gap (30) between the ends of the

partition (12, 13; 14, 15) facing the strip and the upper and lower strip surfaces by a cushion of a compressed gas buffer generated by the gas under pressure.

Firstly, applicant would like to point out that U.S. patent 5,775,152 corresponds to the prior art reference DE 195 35 168 which is discussed in the instant application in the paragraph bridging pages 2 and 3. The number of the priority document cited on the U.S. patent document is incorrect; it should read DE 195 35 168. Accordingly, the disclosure of this document has been discussed in the instant specification.

This prior art partition according to US 5,775,152 for keeping dry cold-rolled strip in the delivery area of a roll stand by deflecting means for deflecting liquid rolling medium and/or for removing sprayed or splashed liquid adhering to surfaces of the strip is comprised of a fixedly installed part and a movable part arranged at the strip side (see col. 3, lines 47-55). It extends above the strip delivery area up to the stand platform and below the strip delivery area down to the base plate. On the movable part of the partition the following device parts are arranged (see col. 3, lines 56-67):

- a roll barrel blowing device for removing squeezed-off rolling medium from the finish-rolled strip;
- a **mechanical roll barrel gap seal** for sealing the roll space

located above the strip relative to the strip;

- a strip edge blowing device for generating an air flow at a right angle to the strip in the roll gap at the delivery side above the running strip by which the entrained rolling oil is deflected away from the strip laterally of the strip edge;
- a vapor suction device configured to generate a parallel air flow counter to the strip running direction above and below the strip.

In contrast to this, the present invention provides a **contactless seal** in the form of a cushion of compressed gas.

The British document GB 1 481 022 describes an air cushion effect which however is not used for sealing two spaces relative to one another but for supporting the strip S and the upper pneumatic pad 20. The air cushion makes the strip S float on the lower pad and makes the upper pad float on the strip S (see page 2, lines 5-7; lines 71-74; lines 122-127). The pressure is great enough to accomplish the floating effect and to remove the residual lubricant from the strip. This prior art reference does not provide a person skilled in the art with a teaching in regard to the gas pressure and the resulting cushion providing a sealing action between the wet and dry areas of a rolling mill.

A person skilled in that art therefore cannot derive a teaching from this reference with respect to providing an air cushion as a seal in a strip-rolling device.

The prior art reference "Novel Seal Designs..." describes seals and safety valves in conduits, in particular, in pressure conduits. The examiner's citation is taken out of context. The described seals are used in liquid pump applications and require non-contact mechanical seals, magnets, and solid bellows to keep the barrier fluid (gas) in place. The seal faces have grooves that pump the barrier fluid (gas) across the seal face and separate the seal faces. This has nothing to do with cold rolling and strip rolling devices where downstream of the last roll stand a partition is provided for drying and keeping dry rolled strips. The design of a pump seal cannot be applied to a rolling mill partition.

Applicant therefore respectfully submits that the combination of references cited by the examiner cannot make obvious the subject matter as claimed in claims 8 to 19.

Therefore, in view of the foregoing, it is submitted that this application is now in condition for allowance and such allowance is respectfully solicited.

Any additional fees or charges required at this time in connection with the application may be charged to Patent and Trademark Office Deposit Account No. 11-1835.

Respectfully submitted,

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Encl.: new claims 8-19; amended paragraphs of pages 1, 2-3, and 5-6 (clean copies and marked-up version); Abstarct

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on November 22, 2002

By: *F. Kuff*  
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